IN THE CLAIMS

Please cancel the pending claims and substitute the following claim set:

18. (Currently amended) A method for monitoring of and fault detection in a process chain in an industrial process, said industrial process comprising at least a first sub-process, (Step 12, 23, 72,) having first variables, (X₂), and at least one second sub-process, (Step11, 21, 22, 71, 73,) having second variables, (X₁), arranged in a process chain, said first sub-process being performed after said second sub-process in said process chain, said method comprises the steps of:

collecting data including said second variables and calculating a multivariate sub-model based on said collected data comprising weighted averages, (t11, t12, t41, t42, t5, t7, t8, t9,) for said second variables for the at least one second sub-process, (Step11, 21, 22, 71, 73);

receiving in the first sub-process, (Step 12, 23, 72,) from the at least second sub-process, (Step11, 21, 22, 71, 73,) said weighted averages, (t11, t12, t41, t42, t5, t7, t8, t9);

collecting data including said first variables related to the first sub-process, (Step 12, 23, 72); and

calculating a multivariate sub-model for the first sub-process, (Step 12, 23, 72,) based on said collected data including said first variables and said weighted averages, (t11, t12, t41, t42, t5, t7, t8, t9).

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19. (Currently amended) A method according to claim 18, **characterized** by the step of transmitting information or data related to the multivariate sub-model calculated for the first sub-process, (Step 12, 23, 72,) to a third sub-process, (Step 13, 74).

20. (Currently amended) A method according to claim 18, **characterized** by the step of performing information or data feedback from the first sub-process, (Step 12, 23, 72,) to the at least one second sub-process, (Step11, 21, 22, 71, 73).

21. (Previously presented) A method according to claim 18, **characterized** in that the data collected for each sub-process comprises process data.

22. (Currently amended) A method according to claim 18, **characterized** in that the step of transferring information received comprises sequential transferring of quality parameters by means of multivariate sub-model score values, (t1,t2,...,tn,) between the sub-processes in the process chain.

23. (Currently amended) A method according to claim 18, **characterized** in that arranging the collected data for the first sub-process, (Step 12, 23, 72,) in one matrix and calculating the sub-model for the first sub-process, (Step 12, 23, 72,) using a principal component analysis like method.

24. (Currently amended) A method according to claim 18, **characterized** in that arranging the collected data for the first sub-process, (Step 12, 23, 72) is in a first, (X_i) and a second, (Y_i) matrix and calculating the sub-model for the first sub-process, (Step 12, 23, 72,) using a PLS like method.

25. (Currently amended) A method according to claim 24, **characterized** by first matrix, (X) comprises process data and the second matrix, (Y_i) comprises quality data.

26. (Currently amended) A method according to claim 1, **characterized** by defining at least one plot, such as score plots, residual plots, residual standard deviation, (DmodX,) plots, contribution plots, or scaled raw data plots for the interpreting the models and occurring process faults.

27. (Previously presented) A method according to claim 26, **characterized** in that outlier detection is provided by analysis of said at least one plot.

28. (Previously presented) A method according to claim 18, **characterized** by using a number of multivariate sub-model observations comprising a prediction set to simulate the process chain.

29. (Previously presented) A method according to claim 18, **characterized** by using a number of multivariate sub-model observations comprising a prediction set to perform on-line monitoring in the process chain.

30. (Currently amended) A first apparatus for monitoring of and fault detection in a process chain in an industrial process employing multivariate data methods, said first apparatus comprising calculating means for calculating a first multivariate sub-model for a first sub-process, (Step 12, 23, 72), wherein said first apparatus comprises means for receiving from at least a second apparatus information or data related to at least a second multivariate sub-model on said collected data comprising weighted averages, (t11, t12, t41, t42, t5, t7, t8, t9,) for said second variables calculated for at least a second sub-process, (Step11, 21, 22, 71, 73,) in said industrial process and that said calculating means is arranged to calculate the first multivariate sub-model based on the information or data received from said apparatus and said second sub-process, (Step11, 21, 22, 71, 73).

31. (Previously presented) A first apparatus according claim 30, **characterized** in that it comprises means for transmitting information or data to a third apparatus.

32. (Previously presented) An apparatus according to claim 30, **characterized** by means for performing information or data feedback to the second apparatus.

33. (Previously presented) A computer program product comprising computer readable code means which, when run on a computer system, makes the computer system perform the steps according to claim 18.

34. (Currently amended) A computer program product according to claim 33 comprising computer readable code means which, when run on a computer system, makes the computer system perform the following additional step:

- transmitting relevant information or data to a third sub-process, (Step 13, 74).